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The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral survey of the Savage Run Wilderness in the Medicine Bow National Forest, Carbon and Albany Counties, Wyoming. The Savage Run Wilderness was

MINERAL RESOURCE POTENTIAL

The Savage Run Wilderness encompasses 14,912

Four southwest-flowing streams drain the area; from north to south they are North Mullen Creek, South Mullen Creek, Savage Run Creek, and Cottonwood Creek (see fig. 2 in pamphlet). Elevations range from about 9,930 ft at the drainage divide near the northeast corner of the area to 7,740 ft near the mouth of Cottonwood Creek in the Southwest.

GEOLOGY

Except for scattered late Tertiary(?) and Quaternary alluvial and colluvial deposits, all rocks in the Savage Run Wilderness are Precambrian in age. The northwestern part of the area is traversed by cataclastic and intensely mylonitized rocks of the northeast-trending Mullen Creek -Nash Fork shear zone (Houston and McCallum, 1961; Houston and others, 1968). Rocks northwest of and locally included within the shear zone are predominantly metasedimentary and metavolcanic units of Proterozoic X (Early Proterozoic) and Archean(?) age. Rocks south of the Mullen Creek -Nash Fork shear zone are all Proterozoic in age and most are gabbroic units of the Mullen Creek mafic complex. Felsic mylonite gneiss and granitic rocks are abundant in the eastern part of the area, and granitic sills, dikes, and small irregular bodies are locally prevalent throughout the mafic complex. The mafic sequence consists chiefly of crudely layered to well-layered, variably metamorphosed gabbro, eucogabbro, anorthositic gabbro, and pyroxenite. Microgabbroic and diabasic phases are important locally, and hybridized phases may be present in proximity to younger felsic intrusive rocks. A few magnetite and local sulfide-enriched zones have been recognized but no significant base - or precious -metal

Northwest- and northeast-trending faults predominate and both groups show evidence of reactivation. The northwest-trending faults generally exhibit more evidence of later movement and have more associated mineralization, although some of the northeast-trending group appear to displace northwesttrending faults and may be mineralized locally. Mineralization is especially prevalent where faults

GEOCHEMISTRY

the most part reflect only the chemistry of the

GEOPHYSICS

Aeromagnetic (U.S. Geological Survey, 1976) and gravity (D. M. Kulik, written commun., 1982, U.S. Geological Survey) surveys accurately reflect the general geology of the area, but the scales of the respective surveys do not provide sufficient sensitivity to indicate local variations that might be related to mineralization.

No mines are presently being worked within or adjacent to the Savage Run Wilderness. However, numerous pits, drill holes, and claim stakes are evidence of recent exploratory and prospecting work in and near the area. The most recent mining activity has been at a small adit and shaft in sec. 30, T. 14 N., R. 80 W., along the southwestern boundary of the wilderness where gold values are present in small veins. Except for the New Rambler mine (see pamphlet) no reliable production or reserve figures are available for any other mineralized properties in the vicinity of the Savage Run Wilderness. However, several workings immediately adjacent to the wilderness contain high metal values and further exploration in these areas may be justified. Values of as much as 800 ppm (23 oz/ton) gold and 24 ppm

LOCATION MAP

STUDIES RELATED TO WILDERNESS

SUMMARY STATEMENT

Although numerous, small gold and copper mining operations were conducted for a number of years around the turn of the century and intermittently thereafter in areas immediately to the east, there is no evidence of any mineral production within the Savage Run Wilderness (fig. 1). Vein-type gold and silver mineralization associated with faults indicates a low resource potential for gold and silver in the northeast and southwest parts of the wilderness, but no resources were identified. Palladium and platinum were recovered from copper ores at the New Rambler mine about 2 mi east of the wilderness, and both metals occur locally in trace amounts in the Savage Run area in rocks of the Mullen Creek mafic complex. The area of this mafic complex has a low resource potential for platinum and paladium and (or) associated nickel, but significant anomalies of these metals in stream-sediment concentrates are absent and no resources were identified. An area of sheared rocks in the northeastern part of the wilderness has a

LOCATION, SIZE, AND ACCESS

acres of the Medicine Bow National Forest in southcentral Wyoming; about 14,000 acres in Carbon County, and 912 acres in Albany County (fig. 1). It is on the west flank of the Medicine Bow Mountains and overlooks the North Platte River and Saratoga Valley. It is approximately 40 mi west of Laramie, 60 mi southeast of Rawlins, 26 mi southeast of Saratoga, and 11 mi north of the Colorado-Wyoming border. The area is roughly bounded on the north, east, and south by unimproved U.S. Forest Service roads (fig. 1), which can be reached via Wyoming State Highways 130 and 230. The western boundary borders the A Bar A Ranch.

concentrations were obtained from any of the analyzed

predominant rock types in any particular area. However, slightly anomalous lead values (>50 ppm) in stream-sediment samples from the headwater regions of Savage Run Creek reflect the presence of argentiferous galena-bearing veins that were observed near the wilderness boundary in that area (see table 2 in pamphlet). Gold values of as much as 0.5 ppm were obtained from stream-sediment concentrates from the lower reaches of Mullen Creek, Savage Run Creek, and Cottonwood Creek, and from Boat Creek immediately below gold vein workings (indicated by vein samples K18, 22-1, and 22-2). All of these samples probably reflect the presence of small, gold-bearing veins similar to those at the Boat Creek locality, and potential for development appears to be limited. Slightly anomalous values of platinum, palladium, and nickel were obtained from both rock chip samples and stream-sediment concentrates from the southeast part of the wilderness along the upper tributaries of Cottonwood Creek. Although these values are in the background range of some mafic rocks, they clearly exceed values obtained from comparable rocks in other parts of the wilderness, and additional geochemical evaluations may be justified.

MINING DISTRICTS AND MINERALIZATION

cobalt value (1,000 ppm) recorded in this study and also contains 10 ppm silver and 15 ppm bismuth (see table 1 in pamphlet). However, none of the workings within the wilderness have produced ore in the past.

MISCELLANEOUS FIELD STUDIE

PAMPHLET ACCOMPANIES MAI

grade specimen samples containing visible native gold

(samples K18, 22-1C, and 22-2D), and small, high-grade

collected from small workings in quartz veins just

outside the southwest boundary of the wilderness

specimen samples from argentiferous galena-bearing vein prospects near the northeast boundary (samples

M553-1 and 2, and M1281-1, 5, 7, and 8) contain as

much as 1,600 ppm (46 oz/ton) silver and more than 2

percent lead, 1 percent arsenic, 1 percent antimony,

and 1 percent zinc, along with as much as 7,000 ppm

copper, 500 ppm cadmium, 70 ppm bismuth, and 70 ppm

small fault zones that appear to have very limited

the wilderness, and mineralized samples commonly

molybdenum (see table 1 in pamphlet). However, these

values are highly anomalous with regard to the bulk of the vein material; and the veins sampled are along

extent. A group of shallow shafts, pits, and trenches are in the shear zone along the northeast boundary of

contain more than 2 percent copper (samples OR 1272B

carbonates of copper along joints and fracture planes

and values for other base and precious metals are low

No evidence of significant mineralization was

observed from samples collected from prospect pits and

from workings within the wilderness were from a small

between quartzite and metagabbro in the North Mullen Creek valley in the NE1/4 sec. 1, T. 14 N., R. 81 W.

(samples M1204-1 and 2). This site has one of the

highest molybdenum values (300 ppm) and the highest

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

Gold and silver

prospect on a gossan zone at the sheared contact

minor workings within the Savage Run Wilderness.

Other than small amounts of copper, the only concentrations of base and precious metals obtained

and OR 1273). Most mineralization is as secondary

Gold and (or) silver occur in small veins associated with faults in several parts of the Savage Run Wilderness, but significant values were obtained only from samples collected immediately adjacent to the southwest and northeast boundary of the wilderness. A few small, high-grade samples with visible native gold, collected from veins just outsid the southwest boundary, yielded gold values of as much as 800 ppm (23 oz/ton), and high-grade samples of argentiferous galena from veins a short distance from the northeast boundary contain as much as 1,600 ppm (46 oz/ton) silver (see table 1 in pamphlet). The veins trend into the wilderness, and the presence of some may be reflected by slightly elevated levels of gold (as much as 0.5 ppm in the southwest) and lead (in excess of 50 ppm in the northeast) in streamsediment concentrates (see table 2 in pamphlet). Silver values for the most part are negligible in the stream sediments, but high lead values (>1 percent) rock chip samples are associated exclusively with argentiferous galena-bearing veins; thus, streamsediment lead is probably a reliable indicator for

Despite the high gold and silver values from isolated veins adjacent to the wilderness, the highgrade nature of the analyzed samples along with the small size and limited extent of most of the veins suggest a low resource potential in the northeast and southwest parts of the wilderness.

Palladium, platinum, and nickel

The southeastern area of the wilderness is

inderlain by a part of the Mullen Creek mafic complex

silver in the area.

and is characterized by slightly anomalous values of palladium, platinum, and nickel in rock chip samples and stream-sediment concentrates (as much as 0.03 ppm and 0.005 ppm Pt, 0.016 and 0.006 ppm Pd, and 3,000 and 200 ppm Ni for rock chip samples and stream sediments, respectively; see tables 1 and 2 in pamphlet). These values are comparable to background values for mafic rocks, but they clearly exceed those of other mafic rocks in the wilderness and indicate that this area has a low potential for Pd, Pt, and (or) Ni resources (see map). More detailed delineation and mapping of specific mafic layers, accompanied by more extensive geochemical sampling might reveal higher local concentrations of these metals, but the absence of any significant anomalies in analyzed stream-sediment concentrates implies a low resource potential in this area.

zones where northwest-trending faults cut the shear zone, and ore minerals are predominantly secondary. Concentrations of other base and precious metals are minimal, and the potential for the occurrence of copper resources is low in the northeast corner of the wilderness. Other commodities

In the northeast corner of the wilderness,

intensely fractured rocks in the east-northeast-

excess of 2 percent; see map and table 1 in

trending subsidiary shear zone of the Mullen Creek-Nash Fork shear zone contain appreciable copper (in

pamphlet). Mineralization was most intense in shatte

No resource potential for other mineral commodities was identified in the Savage Run Wilderness.

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